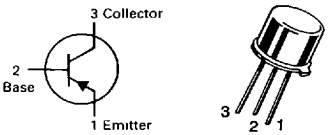
2N4032
2N4033

CASE 79-04, STYLE 1
TO-39 (TO-205AD)



GENERAL PURPOSE TRANSISTORS

PNP SILICON

Refer to 2N4405 for graphs.

MAXIMUM RATINGS

Rating	Symbol	2N4032	2N4033	Unit
Collector-Emitter Voltage	V_{CEO}	−60	−80	Vdc
Collector-Base Voltage	V_{CBO}	−60	−80	Vdc
Emitter-Base Voltage	V_{EBO}	−5.0	−5.0	Vdc
		2N4032	2N4033	
Collector Current — Continuous	I_C	−1.0		Adc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	0.8 4.56		W mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	4.0 22.8		W mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +200		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	140	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	25	°C/W

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage(1) (I_C = −10 mA)	 2N4032 2N4033	$V_{(BR)CEO}$	 −60 −80	 — —	V
Collector-Base Breakdown Voltage (I_C = −10 μA)	 2N4032 2N4033	$V_{(BR)CBO}$	 −60 −80	 — —	V
Emitter-Base Breakdown Voltage (I_E = −10 μA)		$V_{(BR)EBO}$	−5.0	—	V
Collector Cutoff Current (V_{CB} = −50 V) (V_{CB} = −60 V) (V_{CB} = −50 V, T_A = 150°C) (V_{CB} = −60 V, T_A = 150°C)	 2N4032 2N4033 2N4032 2N4033	I_{CBO}	 — — — —	 −50 −50 −50 −50	nA μA
Emitter Cutoff Current (V_{EB} = −5.0 V)		I_{EBO}	—	−10	μA
ON CHARACTERISTICS					
DC Current Gain (I_C = −100 mA, V_{CE} = −5.0 V, @ −55°C)(1) (I_C = −100 μA, V_{CE} = −5.0 V) (I_C = −100 mA, V_{CE} = −5.0 V)(1) (I_C = −500 mA, V_{CE} = −5.0 V)(1) (I_C = −1.0 A, V_{CE} = −5.0 V)F(1)	 2N4032,33 2N4032,33 2N4032,33 2N4032,33 2N4032 2N4033	h_{FE}	 40 75 100 70 40 25	 — — 300 — — —	—

ELECTRICAL CHARACTERISTICS (continued) (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Max	Unit
Collector-Emitter Saturation Voltage(1) (I_C = −150 mA, I_B = −15 mA) (I_C = −500 mA, I_B = −50 mA) (I_C = −1.0 A, I_B = −100 mA)	2N4032	$V_{CE(sat)}$	 — — —	 −0.15 −0.50 −1.0	V
Base-Emitter Saturation Voltage(1) (I_C = −150 mA, I_B = −15 mA)		$V_{BE(sat)}$	—	−0.9	V
Base-Emitter On Voltage (I_C = −1.0 A, V_{CE} = −1.0 V) (I_C = −500 mA, V_{CE} = −0.5 V)(1)	2N4032	$V_{BE(on)}$	 — —	 −1.2 −1.1	V
SMALL-SIGNAL CHARACTERISTICS					
Ouput Capacitance (V_{CE} = −10 V, f = 1.0 MHz)		C_{obo}	—	20	pF
Input Capacitance (V_{EB} = −0.5 V, f = 1.0 MHz)		C_{ibo}	—	110	pF
Small Signal Current Gain (I_C = −50 mA, V_{CE} = −10 V, f = 100 MHz)		h_{fe}	1.5	5.0	—
SWITCHING CHARACTERISTICS					
Storage Time (I_C = −500 mA, I_{B1} = I_{B2} = −50 mA)		t_s	—	350	ns
Turn-On Time (I_C = −500 mA, I_{B1} = −50 mA)		t_{on}	—	100	ns
Fall Time (I_C = −500 mA, I_{B1} = I_{B2} = −50 mA)		t_f	—	50	ns

(1) Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

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